

Claims

- [c1] A method for the production of energy, carbon and hydrogen in a combined cycle, the method comprising the steps for
- (a) using an Electric Arc Hydrogen Plasma Black Reactor wherein hydrogen, carbon monoxide, carbon, ash and sulfur are produced and used and wherein said Reactor consumes a carbonaceous fuel;
 - (b) using a Direct Carbon Fuel Cell wherein a molten salt delivers the carbon produced in step (a) as a feedstock and wherein electricity and hot carbon dioxide gas are produced and used;
 - (c) using a Water Gas Shift Reactor wherein the hydrogen, and carbon monoxide produced in step (a) is used and wherein water and carbon dioxide gases from step (d) are used and wherein hydrogen, carbon monoxide and carbon dioxide are produced and used;
 - (d) using a Solid Oxide Fuel Cell wherein hydrogen and carbon monoxide from step (c) are consumed and wherein electricity is produced and used and wherein carbon dioxide gas and water are produced and used;
 - (e) using a Steam Boiler Rankine Cycle wherein the hot carbon dioxide gas produced in the Direct Carbon Fuel

Cell of step (b) is used, wherein the water and carbon dioxide gas produced in the Solid Oxide Fuel Cell of step (d) is used and wherein steam is produced and used.

- [c2] A method for the production of energy, carbon, carbon monoxide and hydrogen from a carbonaceous fuel in a combined cycle, the method comprising
 - (a) a step for using an Electric Arc Hydrogen Plasma Black Reactor wherein hydrogen, carbon monoxide, carbon, ash and sulfur are produced and used; and,
 - (b) a step for using a Direct Carbon Fuel Cell wherein a molten salt delivers the carbon produced in step (a) as a feedstock and wherein electricity and hot carbon dioxide gas are produced and used.
- [c3] The method of claim 2 further comprising a step for using a Steam Boiler Rankine Cycle wherein steam is produced and used.
- [c4] The method of claim 2 further comprising a step for using a Water Gas Shift Reactor wherein hydrogen, carbon monoxide and carbon dioxide are produced and used.
- [c5] The method of claim 2 further comprising a step for using a Solid Oxide Fuel Cell wherein electricity is produced and used and wherein carbon dioxide gas and water are produced and used.

- [c6] The method of claim 2 further comprising a step for using a Fischer-Tropsch Catalytic Reactor wherein water and gasoline and diesel fuel are produced and used.
- [c7] The method of claim 2 further comprising a step for using a Methanol Catalytic Converter wherein water and methanol are produced and used.
- [c8] The method of claim 2 further comprising a step for using a Catalytic Methanator wherein water, gaseous methane and C₁ to C₄ hydrocarbons are produced and used.
- [c9] The method of claim 2 further comprising a step for using a Water Electrolyzer wherein hydrogen and oxygen are produced and used.